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B

Optical Method for Investigation of the Processes
Taking Place During Stretching of Polystyrene Films;
and Determination of Photoelastic Constants in the
Temperature Range from 12 to 140°C. (In Russian.)
O. N. Trapeznikova. *Zhurnal Fizicheskoi Khimii*
(Journal of Physical Chemistry), v. 21, Mar. 1948,
p. 395-408.
Methods used and data obtained (presented in
graphic and tabular form) are indicated. 11 ref.

1

USSR/Chemistry - Styrene, Polymerized
Chemistry - Films, Stretching of
Mar 1948

"An Optical Method for the Study of Processes Occur-
ring During the Stretching of Films of Polystyrene,
and Determination of the Photoelastic Constant at a
Temperature Interval from 12 to 140 Degrees Centi-
grade," O. N. Trapeznikova, Phys Inst, Leningrad
State U, 14 pp

"Zhur Fiz Khim" Vol XIII, No 3

Briefs the properties and molecular structure of poly-
styrene. Describes with the aid of diagram the pro-
cedure followed in the experiment, and tabulates and

65T17

USSR/Chemistry - Styrene, Polymerized
(Contd)
Mar 1948

analyzes results of the measurements made. Observes
that double refraction has both positive and negative
effects on polystyrene. Submitted 16 Feb 1947.

65T17

TRAPEZNIKOVA, O.

USSR/Chemistry - Photoelasticity Dec 50

"Molecular Rotation and the Temperature Dependence of the Photoelastic Coefficient of Polymethylmetacrylate," O. N. Trapeznikova, M. N. Zhurina, Leningrad State U imeni A. A. Zhdanov

"Zhur Fiz Khim" Vol XXIV, No 12, pp 1471-1485

Temperature dependence of photoelastic coefficient of polymethylmetacrylate from 30-190°C suggests the COOCH₃ group rotates and its anisotropy falls as temperature increases. Then, when motion of the COOCH₃ group is "frozen," this dependence characterizes mobility

170T19

USSR/Chemistry - Photoelasticity (Contd) Dec 50

of the carbon chain. Resemblance between this "frozen" dependence and temperature dependence of photoelastic coefficient of polystyrene points to absence of motion of benzene rings in polystyrene. "Frozen" photoelastic coefficient always has negative sign, this agreeing with the large anisotropy of the COOCH₃ group as compared with the CH₃. There is evidence of simultaneous existence of negative and positive double refractions in polymethylmetacrylate. Dependence of photoelastic coefficient on stress suggests the COOCH₃ groups interact, preventing deformation of the carbon chain.

170T19

PA 170T19

TRAPEZNIKOVA, O. N.

USSR/Physics of High - Molecular Substances

D-9

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11544
Author : Zhurina, M.N., Trapeznikova, O.N.
Inst : Leningrad University

Title : Rotation of Molecular Groups and Temperature Dependence of
the Photoelastic Coefficient of Certain Polymers.

Orig Pub : Zh. fiz. khimii, 1956, 30, No 10, 2190-2203

Abstract : A measurement is made of the dependence of the photoelastic coefficients of polymers of ethylmetacrylate, butyl metacrylate, methyl metacrylate, and vinyl acetate from -10 to $+150^{\circ}$, and the temperature variation of the birefringence of previously-oriented specimens from -10 to -180° . The time curves of loading and unloading were investigated, as was the dependence of the photoelastic coefficient and the stress in the highly-elastic state.

Card 1/1

AUTHORS: Trapeznikova, O. N., and Smirnova, G. Ye. 51-6-12/25

TITLE: Scattering of Light in Crystalline Polymers.
1. Formation and Melting of the Crystalline Phase
in Chloroprene Rubber. (Rasseynaniye sveta v
kristallicheskih polimerakh. 1. Obrazovaniye
i plavleniye kristallicheskoy fazy v khloroprenovom
kauchuke.)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol. III, Nr. 6,
pp. 631-637. (USSR)

ABSTRACT: The purpose of this work was to study the process
of the formation and melting of the crystalline phase
of chloroprene rubber polymer. Light scattered by
large particles in the polymer is mostly refracted and,
due to anisotropy of these particles, should be con-
siderably depolarized. Therefore measurements were
made in polarized light and indicatrices (character-
istics) for polarized and depolarized components of
the scattered light were obtained. It was possible
to separate out the direct polarized beam and to

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Scattering of Light in Crystalline Polymers. 1.

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study depolarized light in forward direction. Chloroprene rubber crystallizes at room temperature in several days, and this makes it possible to study crystallization in all its stages. Films of 0.1 mm thickness were used as samples. They were prepared from solutions in benzene or carbon tetrachloride. The refractive index of amorphous films was about 1.57. The mean refractive index of strongly orientated films was about 1.6. Thus the refractive indices of the crystallites in chloroprene rubber and of the surrounding medium were practically identical. Green (0.508-0.510 μ) light was used in these studies. A parallel beam of light passed through a polarizer, the sample studied, an analyser, and entered a receiver (a photoelectric tube $\Phi \ni Y -19$). The plane of polarization of the incident light was at 45° to the plane of observation. To determine the scattering indicatrices the receiver was moved in a horizontal plane along the circumference of a circle whose centre was in the sample. The light beam was 2 mm wide and 10 mm high; consequently the scattering volume was

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Scattering of Light in Crystalline Polymers. 1.

about 2 mm³. Fig.1 shows the change with time of the scattering indicatrix obtained in crossed nicols, while Fig.2 shows a similar change in parallel nicols. The indicatrices in Fig.1 were obtained after 1-20 days of crystallization, and those in Fig.2 after 1-7 days of crystallization. Measurements of the scattering indicatrices during melting of the crystalline phase show that the indicatrices do not change in their form (Fig.3). Fig.4 shows the temperature dependence of the intensity of light scattered in a forward direction (in crossed nicols) for a polychloroprene film crystallized at room temperature. Fig.5 shows a similar curve for polychloroprene crystallized at 0°C. Fig.6 shows a temperature hysteresis in the scattered light intensity. From the results obtained the authors conclude that slow crystallization of polychloroprene is not due to a slow growth of crystallites but due to a low probability of formation of crystallization nuclei. At the beginning of crystallization a small number of large crystals appears,

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51-6-12/25

instead of the expected large number of small nuclei. Assuming the particles to be isotropic, and using a formula for spherical particles whose dielectric properties do not differ much from those of the surrounding medium (Ref.4) the authors obtained some estimates of the dimensions of crystallites. At the beginning of crystallization the crystallite radius is about 5μ . In the middle and at the end of crystallization dimensions of crystallites found from scattering at low angles are about 5μ , while the radius calculated from high-angle scattering is about 1.5μ . The dimensions of particles calculated from the integro-differential equation of Shifrin (Refs. 4, 5) are found to agree well with experiment. Since the form of the scattering indicatrices does not change on melting of crystallites, it follows that the amount of the crystalline phase does not change but only the nature of the crystalline lattice is affected in all crystallites at the same time. The hysteresis effect and the occurrence of steps in the curves obtained

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Scattering of Light in Crystalline Polymers. 1.

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on melting also indicate that changes occur inside the crystallites themselves instead of melting and recrystallization of whole crystallites. The interpretation of the crystallization and melting processes proposed in the present paper agrees fully with the results obtained on other polymers by means of polarization microscopy. The authors thank E. I. Sharakh ova who helped with the measurements, and K. S. Shifrin for valuable advice. There are 6 figures, 1 table and 6 references, of which 2 are Russian and 4 English.

ASSOCIATION: Leningrad State University imeni A. A. Zhdanov
(Leningradskiy gosudarstvennyy universitet im.
A. A. Zhdanova.)

SUBMITTED: February 14, 1957.

AVAILABLE: Library of Congress.
Card 5/5

AUTHOR:

TITLE:

PERIODICAL:

ABSTRACT:

SOCHAVA, I. V., TRAPEZNIKOVA, O. N.

The Heat Capacity of Chain-Like Structures at Low Temperatures.

(Teploymkost tsepnnykh struktur pri nizkikh temperatur, Russian)

Doklady Akademii Nauk SSSR, 1957, Vol 113, Nr 4, pp 784-786 (U.S.S.R.)

Received: 6 / 1957

Reviewed: 7 / 1957

For the purpose of a further precise explanation of the character of the temperature dependence of the heat capacity of the chain-like structures at low temperatures the heat capacities of polyethylene within the interval of from 58 to 273° K and of polyvinyl alcohol in the interval of from 58 to 245° K was measured by the authors. Polyethylene and polyvinyl alcohol are organic linear polymers with a strong valence interaction of the atoms along the chain and with a weaker molecular interaction between the chains. One of the usual vacuum calorimeters was used for the work. The samples were kept in a glass cylinder filled with helium. Temperatures were measured by means of a platinum thermometer. The samples consisted of finely divided pieces of not more than 1 mm³ volume. The samples were technically pure. - The attached table does not contain the experimental values of the heat capacity but the values computed from the smoothed experimental curve. Conclusions as to the character of the temperature dependence are best drawn from the inclination of the curve lgC with respect to the axis lgT. Within that temperature domain, in which the interaction of the chains may be neglected, the heat capacity may be

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PA - 3042

The Heat Capacity of Chain-Like Structures at Low Temperatures.
 represented by the relation $C = AT^m$. Here $m = 1$ or $m = 1/2$ and $A = \text{const}$
 apply. The inclination of the experimental curves gives the experi-
 mental values of m . In the case of polyethylene the value of m changes
 steadily from a value larger than one up to a value of 0,89. Within
 the interval of 95 up to 185° K, m remains constantly equal to 0,89
 and from 185° K upwards, m increases steadily. This fact is connected
 with the "de-glassing" of the polymer beginning in this domain. In the
 case of polyvinyl alcohol, within the interval of from 58 - 120° K
 an additional heat capacity is observed on the curve of the heat ca-
 pacity, which might be due to the excitation of the rotation of the
 OH-group. Also for glass the experimental value of m is very near to,
 but always above one. According to the experimental data obtained by
 the authors, m is a little smaller than one. Therefore, the formula
 suggested by TARASOV et al. for the heat capacity, according to the
 opinion of the authors, agrees better with the experiment than the
 formula by LIFSHITS. (1 Illustration and 1 Table).

ASSOCIATION:
 PRESENTED BY:
 SUBMITTED:
 AVAILABLE:
 Card 2/2

Leningrad State University
 A.I.IOFFE, Member of the Academy
 1.11.1956
 Library of Congress

AUTHORS: Sochava, I. V., Trapeznikova, O. N. SOV/54-58-3-7/19

TITLE: Internal Rotation and Specific Heat of Some Polymers at Low Temperatures (Vnutrenneye vrashcheniye i teployemkost' nekotorykh polimerov pri nizkikh temperaturakh)

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1958, Nr 3, pp 65-72 (USSR)

ABSTRACT: In order to investigate thoroughly the internal rotation in polymethyl methacrylate (PMMAC) the temperature dependence of its specific heat and of the specific heat of methyl methacrylate (MMAC) in the range of low temperatures was examined in the present paper. The specific heat of polystyrene was investigated in the range of from 60 to 200°K. Pertaining experimental data are given in table 1. They show the specific heat which is caused by the acoustic spectrum of the polymer and by the intramolecular vibrations of the side groups. Beneath the rotation vibrations also valence and deformation vibrations of the ether group in PMMAC and of the benzene ring in polystyrene belong to the intramolecular vibrations. In the investigation the Raman spectra ascertained by Roy (Refs 4, 5) were employed; the

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SOV/54-58-3-7/19

Internal Rotation and Specific Heat of Some Polymers at Low Temperatures

specific heats corresponding to these spectra were computed according to the Einstein (Eynshteyn) formula (Table 2). The additional specific heat observed in PMMAC in the range 60 - 130°K is assumed to be caused by the excitation of rotation oscillations in the CH₃ group which modify the anisotropy of the molecule. On the curve of MMAC an additional specific heat was observed as well. Its maximum is displaced somewhat towards lower temperatures. The presence of an additional specific heat in polystyrene was unexpected as the internal rotation of the benzene rings about the C-C axis should meet considerable steric resistance. The excitation of rotation vibrations in the benzene ring in polystyrene agrees with Zhurkov's conception (Ref 7). To obtain at least approximative data on the specific heat that is connected with the acoustic spectrum the tables by Pitzer (Pittser)(Ref 2) were employed. The starting point of the investigation was the specific heat of polyethylene; 0 (Table 3) and the specific heats, connected with the acoustic spectrum were computed for all polymers the experimental values of the specific heat of which are known. The difference between experimental and theoretical values in all

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SOV/54-58-3-7/19

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cases was not more than 7 %. A comparison of the specific heats of PMMAC (Fig 3) and of polystyrene (Fig 4) confirms the correctness of the assumptions. As their molecular weight in grams is almost equal (100 and 104) their curves are similar as well. The good agreement of experimental and theoretical results in a wide range of temperatures proves the validity of the linear law for the specific heat. There are 4 figures, 3 tables, and 9 references, 5 of which are Soviet.

SUBMITTED: March 5, 1958

Card 3/3

(Wave Equation, Differential Equations)

Trautman, A. Boundary conditions at infinity for physical theories. Bull. Acad. Polon. Sci. Sér. Sci. Math. Astr. Phys. 6 (1958), 403-406.

L'auteur remarque que la solution de l'équation des ondes:

$$\Delta \varphi - \partial^2 \varphi / \partial t^2 = -4\pi \rho$$

(ρ nul en dehors d'une région spatialement bornée) donnée par les potentiels retardés satisfait à des conditions à l'infini dans l'espace de la forme:

$$\varphi = O(r^{-1}), \quad \varphi_{, \nu} = \psi k_{\nu} + O(r^{-2}),$$

où

$$\psi = O(r^{-1}), \quad k^{\mu} = (1, n^{\mu}), \quad n^{\mu} = x^{\mu}/r.$$

φ satisfait alors à la condition de radiation de Sommerfeld $\lim_{r \rightarrow \infty} r k^{\nu} \varphi_{, \nu} = \lim_{r \rightarrow \infty} (r(\partial \varphi / \partial t) + r(\partial \varphi / \partial r)) = \sigma$, le tenseur d'impulsion-énergie correspondant a alors la forme asymptotique

$$4\pi T_{\mu\nu} = \psi^2 k_{\mu} k_{\nu} + O(r^{-3})$$

et la radiation d'énergie est

$$4\pi W_{\mu} = \int_S T_{\mu}^{\alpha} n_{\alpha} dS = \int_S \psi^2 k_{\mu} dS$$

où S est la surface "à l'infini" d'une sphère spatiale.

L'A. adapte ensuite les conditions précédentes aux équations de Maxwell, compte tenu de l'invariance de

2
1-FW

ye
11/2

TRAUTMAN, A.

gauge et formule pour le potentiel électromagnétique A^μ :

$$A^\mu = O(r^{-1}), \quad A_{\mu, \sigma} = B_\sigma k_\sigma + O(r^{-2})$$

ou

$$B_\mu = O(r^{-1}) \text{ et } B_\sigma k_\sigma = O(r^{-2}).$$

Asymptotiquement le champ est alors une onde plane et le tenseur $T_{\mu\nu}$ a la forme:

$$4\pi T_{\mu\nu} = -B_\sigma B_\sigma k_\mu k_\nu + O(r^{-3})$$

(fluide de masse au regres nulle, champ électromagnétique singulier de Lichnerowicz et Marlot).

Y. Faurès-Bruhat (Marseille)

SOCHAVA, I.V.; TRAPEZNIKOVA, O.N.

Internal rotation and heat capacity of some polymers at low
temperatures [with summary in English]. Vest. LGU 13 no.16:
65-72 '58. (MIRA 11:11)
(Polymers--Molecular rotation) (Heat capacity)

TRAPEZNIKOVA, O.N.

Rotational isomerism in polymethylmethacrylate and its effect on
the temperature dependence of the heat capacity. Fiz. tver. 1 no.4:
656-665 '59. (MIRA 12:6)

Leningradskiy gosuniversitet im. A.A. Zhdanova.
(Methacrylic acid) (Isomerism) (Specific heat)

NOVIKOVA, G.Ye.; TRAPEZNIKOVA, O.N.

New type of crystal structure in gutta-percha. *Fiz.tver.tela*.
1 no.12:1789-1790 D '59. (MIRA 13:5)

1. Fizicheskly institut Leningradskogo gosudarstvennogo
universiteta.
(Gutta-percha)

SOCHAVA, I.V.; TRAPEZNIKOVA, O.H.

Rotation of methyl groups in polymethylmethacrylate at low
temperatures. Vest.LGU 20 no.22:71-74 '65.

(MIRA 18:12)

TRAPPEZNIKOV, G.N.

Molecular rotation in polymers. Part 2. Vest. LGU 20 no.16;
58-67 '65. (MIRA 18:9)

TRAPEZNIKOVA, O.N.; FEOFANOVA, Ye.I.

Molecular rotation in polymers. Part 1. Vest. LGU 20 no.10;60-75 '65.
(MIRA 18:7)

ACCESSION NR: AP4043968

S/0138/64/000/008/0001/0005

AUTHOR: Novikova, G. Ye., Trapeznikova, O. N.

TITLE: Refractometric investigations on the crystallization and melting of the crystalline phase of chloroprene rubber

SOURCE: Kauchuk i rezina, no. 8, 1964, 1-5

TOPIC TAGS: rubber, chloroprene rubber, rubber crystallization, rubber melting, refractometry, refractive index, polychloroprene, synthetic rubber

ABSTRACT: The effect of the temperature of crystallization (T_{cr}) on the melting temperature (T_{melt}) and the range of $\Delta T = T_{cr} - T_{melt}$ for polychloroprene rubber was determined by a simple and convenient refractometric method. The range of melting temperatures was found to depend linearly on the temperature of crystallization. The temperature dependence of the refractive index of polychloroprene samples, crystallized at different temperatures, as well as of amorphous polymers over a temperature range of -35 to 70C was also measured, using IRF-22 and RLU refractometers of the Abbe type. A schematic view and description of the apparatus for cooling the refractometer are given. Tabulated data show that optimum crystallization is obtained at -10C, which agrees with

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ACCESSION NR: AP4043968

the data of dilatometric measurements. With increasing T_{cr} , the melting temperature of the crystalline phase increases slightly, but the melting range decreases. The experimental data show that the degree of crystallization of polychloroprene samples can be determined refractometrically. Orig. art. has: 6 figures, 1 table and 2 formulas.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo Kauchuka im. S. V. Lebedeva (All-Union Scientific Research Institute for Synthetic Rubber)

SUBMITTED: 00

ENCL: 00

SUB CODE: MT

NO REF SOV: 004

OTHER: 001

Cord 2/2

TRAPEZNIKOVA, O.N.; FEOFANOVA, Ye.I.

Rotational shift of benzene rings in polystyrene at low
temperatures. Zhur. fiz. khim. 35 no.5:1114-1119 My '61.
(MIRA 16:7)

1. Leningradskiy universitet imeni Zhdanova.
(Styrene polymers--Optical properties)


TRAPEZNIKOVA, O.N.; SHIGAYEVA, L.B.

Crystalline formations in thick films of polymethyl methacrylate.
Vest, LGU 17 no.22:56-62 '62. (MIRA 15:12)
(Methacrylic acid) (Crystals)

S/054/62/000/004/003/017
B101/B186

AUTHORS: Trapeznikova, O. N., Shigayeva, L. B.
TITLE: Crystalline structures in thick polymethyl methacrylate films
PERIODICAL: Leningrad. Universitet. Vestnik. Seriya fiziki i khimii,
no. 4, 1962, 56-62

TEXT: Microscopic studies were carried out on polymethyl methacrylate films obtained by pouring a concentrated solution of the polymer onto a mercury surface. Six-pronged stars were formed, which showed different forms depending on the test conditions but which always had hexagonal symmetry. The crystals formed only from the syndiotactic fraction of polymethyl methacrylate. The rate and the type of polymerization (thermal or with benzoyl peroxide) and the deformation of the film had no effect on the amount of crystals formed. Since no crystallization occurred when solutions of polymethyl methacrylate were poured onto glass, an orienting effect is assumed for Hg. The easy crystallization suggests a high degree of order of the polymer molecules in solutions. There are 12 figures.



SUBMITTED: May 5, 1962
Card 1/1

TRAPEZNIKOVA, O.N.; NOVIKOVA, G.Ye.; MINAKOVA, S.V.

Light scattering in crystalline polymers. Part 2: Investigating the temperature dependence of the refraction indices of both the crystalline and the amorphous phase of polychloroprene and determining the extent of crystallization. Opt. i spektr. 11 no.3:353-358 S '61. (MIRA 14:9)

(Light—Scattering) (Chloroprene—Optical ~~prop~~ properties)

USPENSKAYA, V.D.; TRAPEZNIKOVA, S.S.; ISAULOVA, M.V.; ZYKOVA, V.P.

Identification of α_3 -protein in dogs with a haptoglobin. N- and C-terminal groups of α_3 -protein. Dokl. AN SSSR 152 no.3:754-757 S '63. (MIRA 16:12)

1. Institut biologicheskoy i meditsinskoy khimii AMN SSSR.
Predstavleno akademikom V.A.Engel'gardtom.

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TRAPEZNIKOVA, T.V.

TRAPEZNIKOVA, T.V.

Measles encephalitis. Sbor.trud.Tashk.KBNP no.1:166-170 '56

(MIRA 11:3)

(MEASLES) (ENCEPHALITIS)

TRAPEZNIKOV'A, T.V., kand. med. nauk

Clinical aspects of craniocervical anomalies. Vrach. delo
no.10:89-92 O '63. (MIRA 17:2)

1. Kafedra nervnykh bolezney (zav. - prof. Ya.Ya. Gordon)
Tashkentskogo instituta usovershenstvovaniya vrachey.

TRASHLIEV, Khr.; KHADZHIIANAKIEV, Asp.

Geographic zoning of soils in the Kolarovgrad District. Izv
Inst "Nikola Pushkarov" 6:5-14 '63.

TRASS, Kh. Kh.

"Analysis of the lichen-flora of the Estonian SSR."

report submitted for 10th Intl Botanical Cong, Edinburgh, 3-12 Aug 64.

Tartu State Univ.

TRAPEZNIKOVA, T. V.

Trapeznikova, T. ".

"The clinical aspects of certain forms of encephalitis in the postwar period."
Tashkent State Medical Inst imeni V. M. Molotov. Tashkent, 1956.
(Dissertation For the Degree of Candidate in Medical Science).

Knizhnaya letopis'
No 34, 1956. Moscow.

GORDON, Ya.Ya., prof.; TRAPEZNIKOVA, T.V., kand.med.nauk

Functional chronaximetry of the muscles and the vasculocutaneous
reflexes in various brain diseases. Med. zhur. Uzb. no.11:46-48
N '60. (MIRA 14:5)

1. Iz kafedry nevropatologii Tashkentskogo gosudarstvennogo instituta
usovershenstvovaniya vrachey.
(CHRONAXIA) (MUSCLES) (REFLEXES)
(BRAIN--DISEASES)

TRAPEZNIKOV, V. A

"Electronic Modeling Installation Type EMU-5," by V. A. Trapeznikov, B. Ya. Kogan, V. V. Gurov, and A. A. Maslov, Pribory i Stendy, Institut Tekhniko-Ekonomicheskoy Informatsii, Akademiya Nauk SSSR, Theme 10, No P-56-422, 1956

This 120-page book describes the construction, performance, and capabilities of the EMU-5 analog computer. It has several block and circuit diagrams of the computer.

It was at the Institute of Automatics and Telemechanics, Academy of Sciences USSR, that the new EMU-5 electronic analog computer was developed under the direction of V. A. Trapeznikov and B. Ya. Kogan, in which the shortcomings of the former models (EMU-1, 2, 3, and 4) have been eliminated to a greater degree. The following persons were engaged in developing various components of the computer: V. V. Gurov and V. M. Yevseyev -- the linear unit of the computer; A. D. Talantsev, A. A. Maslov, and F. Ye. Taranin -- the nonlinear attachment, multiplying-dividing device, and functional converter; and L. M. Barilenko and A. Ye. Kyaksht -- the power unit. Structural design was executed by Ye. D. Afonina, L. M. Barilenko, Ye. A. Cheglov, P. A. Anikeyev, and P. V. Tikhonov.

The computer is designed to solve linear and nonlinear differential equations through the sixth order, with constant and variable coefficients. The machine has provisions for hook-up with auxiliary units and other analog computers for the solution of more complex problems having equations of a still higher order.

Sum. 1366

AGEYEV, N.V.; TRAPEZNIKOV, V.A.

Preparation of pure chromium. Issl.po zharopr.splav. 4:
237-247 '59. (MIRA 13:5)

(Chromium--Metallurgy)

TRAPEZNIKOV, V. A. (Academician)

"Basic Theoretical and Engineering Problems of Automatic Control."

report presented at the International Federation of Automatic Control Congress,
Moscow, June- July 1960.

Chairman, USSR National Committee of Automatic Control.

AGEYEV, N.V.; FOGEL', A.A.; SIDOROVA, T.A.; TRAPEZNIKOV, V.A.

Fusion of chromium in a suspended state. Zhur.prikl.khim.
33 no.2:332-337 F '60. (MIRA 13:5)

1. Institut metallurgii imeni A.A.Baykova AN SSSR.
(Chromium)

TRAPEZNIKOVA, Z. A.

A53

SA

1511

535.372

Phosphors sensitive to "red" light. / ANTONOV-ROMANOVSKY, V.V.
LEWSCHIN, W.L., MORGENSTERN, Z. L., AND TRAPEZNIKOVA, Z.A. C. R.
Acad. Sci. URSS, 54 (No.1) 19-22(1946).--Irradiation of excited phosphors
by "red" light in some cases accelerates the expenditure of accumulated
light energy and gives rise to a flash effect. Some properties of the
new phosphors producing a bright flash are outlined. Phosphorescence and
flash spectra _____ earth sulphides with 2 activators,
Sm and Ce, or Sm and Eu, are practically the same, presenting broad diffuse
bands. Phosphors with or without Sm show the same type of spectrum, but
without Sm the phosphorescence is sharply increased and the flash is in-
significant. Curves are drawn showing the relative energy output in the
flash of different alkaline-earth phosphors with Sm and Ce, for varying
wavelength of the _____. These phosphors include CaS. SrS in the
ratios 1 : 1 and 1 : 2.

L.S.G.

TRAPEZNIKOVA, Z. A.

Jan/Feb 4

USSR/Physics
Phosphors
Luminescence

"The Flash Mechanism in SrS Phosphors as Effected by Rare-Earth Activators, and the Interactivity of Activators," V. V. Antonov-Peranskiy, V. L. Levashin, Z. L. Morgenshtern, Z. A. Trapeznikova, Phys Inst imeni P. N. Lebedev, Acad Sci USSR, 16 pp

"In Ak Nauk USSR, Ser Fiz" Vol XIII, No 1

States that basic result of the study is that, in phosphors with two rare-earth activators, these activators situate themselves in systematic and orderly manner, thus forming a complex center of luminescence due to certain chemical forces. Bases this conclusion on three independent series of investigations with single-activated and double-activated phosphors, i. e., studies of temperature radiation of excited phosphors, luminescence spectra, and spectral sensitivity of the flash.

PA 36/49789

TRAPEZNIKOVA, Z. A.

PA 174T72

USSR/Physics - Activators
Phosphors

21 Sep 50

"Interaction of Activators in Phosphors," Z.
A. Trapeznikova

"Dok Ak Nauk SSSR" Vol LXXIV, No 3, pp 465-468

Considers phosphors SrS-Ce, Sm and SrS-Eu, Sm.
Proposes that illumination center is complex
chem compd. By introduction of Pr into ZnS,
one obtains phosphors with red or greenish-
blue illumination, depending on addn of vari-
ous anions or cations. Submitted 11 Jul 50
by S. I. Vavilov.

174T72

CA KRAPELNIKOVA, Z. A.

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Interaction of activators in phosphors. Z. A. Kravchenko, (P. N. Lebedev Phys. Inst. Acad. Sci. U.S.S.R., Moscow), *Zhur. Eksp. Teor. Fiz.* 21, 283-4 (1951); *C.A.* 45, 454. — The effects of one activator on the emission of the other, such as the enhancement and displacement of the Sn lines in CaS-Sn by small amounts of Mn (Kulshreid, *C.A.* 24, 7102; 31, 610) or the decrease of the light stored by Sn in CaO-Sn by an addition of Pr (cf. Haurer, *C.A.* 34, 334, 1913), cannot be due to accidental pairing of atoms of the 2 activators, present in amounts of the order of 10^{-4} – 10^{-5} g-at./g. Rather, the interaction is due to formation of complexes involving both at. species. This assumption was substantiated by an investigation of the effect of addition of Sn on a soln. of Hf_2SO_4 (2×10^{-3} g. ml.), showing the fluorescence bands 610 (weak), 616 (strongest), 622 (somewhat weaker), and 635 and 637 m μ (very weak); addition of $\text{Sn}(\text{SO}_4)_2$ in an equal amt. increases very markedly the intensity of the 1st 3 bands. Addition of SO_4^{2-} ions alone has no effect. Introduction of a small amt. of Cu into ZnS-Sn converts the doublets in the red and the orange line groups into triplets; with increasing amt. of Cu , the intensity of the characteristic Sn lines decreases in favor of new lines. The spectrum of ZnS-Pr with NaCl as flux consists of 2 bands with max. at 600 and 635 m μ , the latter more intense. The same phosphor with Na_2SO_4 as flux shows a broad band with lines in the range 600–612 m μ , 3 lines in the range 610–620, and a line 633 m μ . With a mixt. $\text{NaCl} + \text{Na}_2\text{SO}_4$ as flux, the same phosphor shows a band with 2 max. at 470 and 537 m μ , 2 very weak lines in the region 500–510 m μ , and, in the red, 3 lines 615.5, 619, and 624.2 m μ , and a group of lines at 647–670, of which 653.5 m μ is the strongest. Thus, NaCl increases the Pr lines in the red, which were hardly noticeable with Na_2SO_4 . A different effect of the nature of the flux is observed with Cu as the 2nd activator. With $\text{Na}_2\text{SO}_4 + \text{NaCl}$ as flux, small amounts of Cu do not alter the lines, but increase the intensity in the continuous bands; greater amounts of Cu give rise, in addition to the previous 653.5 line, to the 2 lines 659.6 and 660.5 m μ , which did not appear clearly in the absence of Cu . With Na_2SO_4 alone, the latter 2 lines appear even with small amounts of Cu , and the intensity of lines in the green is increased. With larger amounts of Cu , the lines in the red which were present with Na_2SO_4 without Cu , or with $\text{Na}_2\text{SO}_4 + \text{NaCl}$, disappear, and an intense line group, 659.6, 660.5, 662, and 662.7 m μ , appears in the range 655–670 m μ . Along with these changes, the basis and the lines in the green increase in intensity. This dependence of the effect of the 2nd activator on the nature of the flux is taken to confirm the formation of complex anions of the type of $[\text{Pr}(\text{SO}_4)_2]^-$ in the ZnS lattice. If, in the complex $\text{Pr}[\text{Pr}(\text{SO}_4)_2]$, the cation is replaced by Cu , or the acid residue by Cl , the fluorescence spectrum will be altered. N. Thon

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APPROVED FOR RELEASE: 03/20/2001

CIA-RDP86-00513R001756510007-9"

ANTONOV-ROMANOVSKIY, V.V.; TRAPEZNIKOVA, Z.A.

On the two recombination mechanisms of the luminescence of Sm^{++} ions in the ZnS-Sm , Cu(NaCl) phosphor. Opt. i spektr. 1 no.2: 204-215 Je '56. (MLRA 9:11)

1. Fizicheskii institut imeni P.N. Lebedeva AN SSSR.
(Phosphors) (Luminescence)

Trapeznikova, Z. A.
USSR/Physics

Card 1/1 Pub. 22 - 15/54

Authors : Trapeznikova, Z. A., and Shchayenko, V. V.

Title : Some optical properties of new zinc sulphide phosphori activated by rare earth elements

Periodical : Dok. AN SSSR 106/2, 230-232, Jan 11, 1956

Abstract : Experiments with zinc sulphide phosphori are described. The experiments were conducted for the purpose of clarifying the effect of a trivalent rare earth element introduced into zinc sulphide phosphori on the optical properties of the latter. Five references: 1 USSR, 1 USA, 3 Germ. (1950-1953). Diagram; illustrations.

Institution : Acad. of Sc., USSR, Physical Institute imeni P. N. Lebedev

Presented by: Academician G. S. Landberg, June 11, 1955

TRAPEZNIKOVA, Z.A.

51-4-10/25

AUTHORS: Manenkov, A.A., Prokhorov, A.M., Trapeznikova, Z.A.
and Fok, M.V.

TITLE: Application of the paramagnetic resonance method to ^{the} study
of the activator state in phosphors. (Primeneniye metoda
paramagnitnogo rezonansa dlya issledovaniya sostoyaniya
aktivatora v fosforakh.)

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy),
1957, Vol.2, No.4, pp.470-474 (U.S.S.R.)

ABSTRACT: This paper was presented at the 5th Conference on
Luminescence in Tartu, June, 1956. From the nature (or
absence) of the paramagnetic resonance spectrum of a crystal
it is possible to deduce the valency state (and changes of
that valency state) of paramagnetic ions in crystal. This is
more difficult for powders when the paramagnetic absorption
lines may be very broad due to relaxation or anisotropy.
These difficulties are particularly pronounced for the case
of ions whose paramagnetism is due to unpaired d-electrons.
Results are reported for powdered SrS:Eu, SrS:Gd and for
artificial CaF₂:Eu monocrystals. Measurements were carried
out at 9340 Mc/s and at room temperature. The apparatus used
is described in Radiotekhnika i Elektronika, Vol.1, 469,
1956. Some of the present results were reported earlier
(A.A.Manenkov and A.M.Prokhorov, Doklady Akad. Nauk SSSR,

Card 1/3

51-4-10/25

Application of the paramagnetic resonance method to study of the activator state in phosphors. (Cont.)

Vol. 107, 402, 1956). In SrS:Eu and $\text{CaF}_2\text{:Eu}$ only the Eu^{2+} ion ($^8\text{S}_{7/2}$ state) is effective; Eu^{3+} is non-magnetic. For Eu^{2+} the electron spin is $7/2$ and therefore 7 electron transitions are possible due to crystal electric field splitting. In SrS:Eu only one of these transitions $M=1/2 \leftrightarrow -1/2$ was found; the others could not be observed due to anisotropic broadening. This one transition was split into 12 hyperfine structure (h.f.s.) components by the interaction of the nuclear spins of the two Eu isotopes: Eu^{151} and Eu^{153} with the electron spin. The SrS:Eu paramagnetic spectrum confirms that the europium activator is in the Eu^{2+} state. In the fluorite ($\text{CaF}_2\text{:Eu}$) spectrum all 7 electron transitions, each with 12 h.f.s. components, were observed. From the h.f.s. of the paramagnetic spectra of SrS:Eu and $\text{CaF}_2\text{:Eu}$ the ratio of the magnetic moments of the Eu^{151} and Eu^{153} nuclei was found to be $\mu_{151}/\mu_{153} = +2.24 \pm 0.03$ nuclear magnetons. Frequency of the absorption lines for $\text{CaF}_2\text{:Eu}$ monocrystals was found to depend strongly on the crystal orientation with respect to the applied constant magnetic field. This indicates that the crystal electric-field

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51-4-10/25

Application of the paramagnetic resonance method to study of the activator state in phosphors. (Cont.)

symmetry departs strongly from the cubic symmetry of the fluorite. In the SrS:Gd phosphor (powdered) only the line corresponding to the electron transition $M=1/2 \leftrightarrow -1/2$ was found. The gadolinium ion is Gd^{3+} in the $^8S_{1/2}$ state. Other electron transitions are not observed due to anisotropy broadening of lines. From a barely visible h.f.s. of the observed line it was estimated that magnetic moments of the Gd^{155} and Gd^{157} nuclei are of the order of 0.2 nuclear magnetons. Paramagnetic resonance study of the SrS:Eu:Sm phosphor excited with violet light indicated no ionization of the Eu^{2+} ion to Eu^{3+} due to excitation. This does not agree with optical studies by the authors which indicate 10% conversion of the Eu^{2+} to Eu^{3+} by ultraviolet light acting on SrS:Eu:Sm. Similar study of the SrS:Tb*Sm phosphors also failed to show any appreciable (more than 1%) ionization of the Tb^{3+} ion to Tb^{4+} . The authors thank V.V.Antenov-Romanovskii for criticism and P.P.Feofilov for supply of $CaF_2:Eu$ crystals. There are 3 figures and 4 references, 2 of which are Slavic.

SUBMITTED: November 9, 1956.
AVAILABLE: Library of Congress

Card 3/3

TRAPEZNIKOVA Z.A.

46-19/56

SUBJECT: USSR/Luminescence

AUTHOR: Trapeznikova Z.A.

TITLE: On the Nature of Luminescence Centers in Zinc-Sulfide Lumino-
phores (O prirode tsentrov svecheniya v tsink-sul'fidnykh
lyuminoforakh)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957,
Vol 21, #5, pp 678-679 (USSR)

ABSTRACT: The properties of zinc-sulfide phosphors activated by rare
earth elements were investigated. It was discovered that:

1. The line luminescence spectrum of Samarium (Sm^{3+}) in
the ZnS-Sm phosphor changes after introduction into the phos-
phor of small quantities of zinc oxide (ZnO).
2. In the excitation spectrum of the ZnS-Sm phosphor a
maximum is observed at the absorption of light with 332 to 333
m μ wavelength. The luminescence spectrum in this maximum
consists of lines characteristic for Sm^{3+} -ions.
3. When instead of oxygen ions other anions (Si^{2-} , Cl^- ,
 Br^- or J^-) are introduced into the phosphor, new peaks also
arise in the excitation curve. The luminescence spectrum of

Card 1/2

48-19/50

TITLE:

On the Nature of Luminescence Centers in Zinc-Sulfide Lumino-
phores (O prirode tsentrov svecheniya v tsink-sul'fidnykh
lyuminoforakh)

Sm³⁺-ions changes simultaneously.

When instead of samarium other activators (rare earth elements,
Cu⁺, Ag⁺, La²⁺ and Pb³⁺) are introduced, the same peak is ob-
served in the excitation curve as in the ZnS-Sm phosphor, which
corresponds to a light with a 332 m μ wavelength. When Zinc
oxide is added, the second excitation maximum arises at 342 m μ .

The report was followed by a short discussion.
One Russian reference is cited.

INSTITUTION: Physical Institute im. Lebedev of the USSR Academy of Sciences
PRESENTED BY:

SUBMITTED: No date indicated

AVAILABLE: At the Library of Congress.

Card 2/2

TRAPEZNIKOVA, Z. A.

48-5-53/56

SUBJECT: USSR/Luminescence

AUTHORS: Manenkov A.A., Prokhorov A.M., Trapeznikova Z.A., and Fok M.V.

TITLE: Application of Paramagnetic Resonance Method for Investigation of the Activator State in Phosphors (Primeneniye metoda paramagnitnogo rezonansa dlya issledovaniya sostoyaniya aktivatora v fosforakh)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957, Vol 21, #5, p 779 (USSR)

ABSTRACT: The paramagnetic resonance method was applied to determine the valence state of an activator in crystallophosphors and to detect the changes of valence during the excitation of phosphors.

The paramagnetic resonance was investigated in the phosphors SrS-Eu; CaF₂-Eu; SrS-Gd and SrS-Tb at the room temperature by means of a superheterodyne radiospectroscope. It was established that Eu in phosphors is in bivalent state (Eu²⁺), and Gd and Tb are in the trivalent states (Gd³⁺ and Tb³⁺).

Card 1/2 The ratio of nuclear magnetic momenta of Eu¹⁵¹ and Eu¹⁵³ nuclei was determined to be 2.24 ± 0.03 by observing the

48-5-53/56

TITLE:

Application of Paramagnetic Resonance Method for Investigation of the Activator State in Phosphors (Primeneniye metoda paramagnitnogo rezonansa dlya issledovaniya sostoyaniya aktivatora v fosforakh)

superfine structure of Eu^{2+} and Gd^{3+} spectra. The values of nuclear magnetic momenta of Gd^{155} and Gd^{157} were estimated to be approximately equal to 0.2 of nuclear magnetons.

One Russian reference is cited.

INSTITUTION: Physical Institute im. Lebedev of the USSR Academy of Sciences.

PRESENTED BY:

SUBMITTED: No date indicated

AVAILABLE: At the Library of Congress.

Card 2/2

AUTHORS: Oranovskiy, V.Ye. and Trapeznikova, Z.A.

SOV/51-5-3-13/21

TITLE: Investigation of the Electroluminescence and Photoluminescence Spectra of Phosphors Activated with Rare-Earth Elements (Issledovaniye spektrov elektro- i fotoluminesstentsii fosforov, aktivirovannykh redkozemel'nyimi elementami)

PERIODICAL: Optika i Spektroskopiya, 1953, Vol 5, Nr 3, pp 302-306 (USSR)

ABSTRACT: The authors studied ZnS-Er,Cu and ZnS-Nd,Cu phosphors with 4.6×10^{-4} g-atoms of Cu and 2.3×10^{-4} g-atoms of Nd or Er per 1 mole of ZnS. The phosphors were prepared in a stream of wet H₂S at 1150°C. ZnS-Er,Cu,Mn phosphor with 4.3×10^{-3} g-atoms of Mn per 1 mole of ZnS was also prepared. The presence of Mn produced a strong band characteristic of manganese and a considerable increase in the brightness of erbium emission as well as the appearance of red lines of thulium (present as an impurity in erbium). The electroluminescence and photoluminescence spectra were recorded photographically using the same capacitor for both purposes. The afterglow spectra produced on photoexcitation were recorded using a rapidly rotating phosphoroscope. Fig 1 compares the electroluminescence (curve 1;

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SOV/51-5-3-13/21

Investigation of the Electroluminescence and Photoluminescence Spectra of
Phosphors Activated with Rare-Earth Elements

and photoluminescence spectra of ZnS-Nd,Cu. Fig 2 gives the electroluminescence spectra of ZnS-Er,Mn,Cu at voltages of 1000 (curve a) and 1500 V (curve b). Fig 3 gives the photoluminescence spectra of ZnS-Er,Mn,Cu. Curve a was obtained at 1/16th of the excitation intensity used to obtain curve b. Fig 4 gives the afterglow spectra of ZnS-Er,Mn,Cu. Again curve a shows the spectrum obtained using 1/16th of the excitation intensity employed to produce curve b. Fig 5 gives the ratio of intensities of the erbium line at 532 mμ and the maximum of the manganese band at 530 mμ for ZnS-Er,Mn,Cu. Curve a represents photoluminescence, curve b refers to the afterglow spectrum and curve v applies to electroluminescence. The following

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Investigation of the Electroluminescence and Photoluminescence Spectra of
Phosphors Activated with Rare-Earth Elements

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conclusions are reached by the authors. (A) The centres responsible for electroluminescence and photoluminescence of $ZnS-Nd,Cu$ and $ZnS-Er,Mn,Cu$ are the same and are similarly distributed throughout the lattice. (B) The emission of the phosphors studied is mainly due to electrons of low energies ("thermal" electrons). (C) The effective volume active in electroluminescence is about 7% of the volume active in photoluminescence. The authors thank V.V. Antonov-Romanovskiy, M.N. Alentsev and M.V. Fok for advice. There are 6 figures and 8 references, 6 of which are Soviet.

ASSOCIATION: Fizicheskii institut im. P.N. Lebedeva, AN SSSR (Physical Institute imeni P.N. Lebedev, Academy of Sciences of the U.S.S.R.)

SUBMITTED: September 13, 1957

Card 3/3 1. Phosphors--Excitation 2. Phosphors--Spectra 3. Luminescence spectra--Analysis 4. Rare earth elements--Applications

POLAND/Optics - Luminescence

K-6

Abs Jour : Ref Zhur - Fizika, No 2, 1959, No 4301

Author : Trapieznikowa Z.A.

Inst : -

Title : Certain Optical Properties of Luminophors Activated by
Rare-Earth Elements.

Orig Pub : Postepy fiz., 1958, 9, No 2, 211-220

Abstract : The author investigated the features of the glow of luminophors based on ZnS, activated with rare-earth elements, mostly Sm. The strong glow of phosphors activated by lanthanides is not connected with the absorption of light by the activators. It arises as a sensitization effect by transfer of energy from special absorption centers, which in the case of ZnS have a maximum near 332-333 millimicrons and which, upon penetration of ions of oxygen (with the aid of ZnO) or Se (ZnS) [sic] or else Cl, Br, or I, have a maximum whose position, in the region from 332 to 342 millimicrons, depends on the nature of the negative ion. The

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TRAPEZNIKOVA, C. A.

5(2) PAGE 1 BOOK EXPLANATION SOV/2602

Abdumalykovich, Institut geokhimiya i analiticheskoy khimii

Radionuclidnyye elementy: polucheniye, analiza, primeneniye (Rare Earth Elements: Production, Analysis, and Use) Moscow, Izd-vo AN SSSR, 1979. 551 p. 5,000 copies printed.

Red. M. I. D. I. Pechenkin, Professor; Eds. of Publishing House: D. N. Trifonov and T. O. Irti, Tech. Eds. B. G. Markovitskiy, Editorial Board: I. P. Alimarin, Corresponding Member, USSR Academy of Sciences, I. E. Zhelezovskiy, Doctor of Chemical Sciences, Z. V. Kozlovskiy, Candidate of Chemical Sciences, V. I. Kuznetsov, Doctor of Chemical Sciences, M. N. Kuznetsov, Candidate of Chemical Sciences, and Yu. E. Shlyapnikov, Candidate of Chemical Sciences.

REMARKS: This book is intended for chemists in general and for geochemists and analytical chemists in particular.

CONTENTS: This collection of articles consists of reports presented at the Rare Earth Elements Symposium held in June 1976 at the Institute of Geochemistry and Analytical Chemistry named V. I. Vernadskiy. The book may be divided into three sections: the characteristics, uses and production of rare earth elements (REE); the methods of analyzing REE; and the application of REE. The first section contains articles on the REE in the earth's crust and the application of REE in industry, and their use as catalysts. Considerable space is devoted to the application of ion-exchange chromatography in the production of pure REE. The second section contains articles on the REE in the environment and their use in industry. The third section contains articles on the REE in the environment and their use in industry. The book is intended for chemists in general and for geochemists and analytical chemists in particular.

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24(7), 24(6)

SOV/51-6-4-16/29

AUTHOR: Trapeznikova, Z.A.

TITLE: On the Interaction of "Blue" and "Samarium" Centres in the ZnS-Sm(Cl) Phosphor ((O vzaimodeystviya "golubykh" i "samariyevykh" tsentrov v fosfore ZnS-Sm(Cl))

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 4, pp 512-516 (USSR)

ABSTRACT: It was shown earlier (Refs 1, 2) that in zinc sulphide phosphors, with or without an activator, centres are formed which absorb light of 332-342 mμ wavelength. The energy absorbed by these centres may be transferred to the activator. These centres are also responsible for the blue emission of non-activated zinc sulphide and are, therefore, called "blue" centres. The present paper deals with the mechanism of transfer of energy between the "blue" and the activator centres and the distribution of both types of centres in zinc sulphide. Two phosphors were studied: ZnS-Sm and ZnS-Sm(Cl). ZnS-Sm(Cl) spectrum at room temperature consisted of a blue band and Sm³⁺ lines. ZnS-Sm emitted only Sm³⁺ lines at room temperature. Samarium (Sm³⁺) and chlorine (Cl⁻) were introduced in amounts of 10⁻³ gram-atoms per mole of ZnS. The intensities of the blue and orange-red bands were recorded by means of a photomultiplier. The phosphors were excited by the mercury line

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On the Interaction of "Blue" and "Samarium" Centres in the ZnS-Sm(Cl) Phosphor SOV/51-6-4-16/29

at 365 mμ and the intensity of excitation was varied by a factor of 65.7. Fig 1 shows, in double logarithmic coordinates, the dependence of the ratio of the intensities of the blue and orange-red emissions on the intensity of the exciting light. Fig 1 shows that this ratio does not remain constant when the excitation intensity is varied. Consequently the "blue" and "samarium" centres are distributed independently of one another in the zinc sulphide lattice. The mechanism of transfer energy from the "blue" centres to the "samarium" ones may be described as follows. The "blue" centres absorb light and are ionized. As a result of thermal vibrations, electrons from a filled band may be transferred to the free ground levels of the "blue" centres. This produces holes in the filled band which migrate to the "samarium" centres and ionize the latter. Such a mechanism requires a definite activation energy, the existence of which was confirmed experimentally. Introduction of chlorine into ZnS-Sm alters the spectrum of the capture levels: the deep capture levels disappear and the number of shallow levels increases. The stored light-sum increases by a factor of ten. The described effects of chlorine are deduced from Figs 2 and 3 which show the thermal de-excitation curves of the phosphors ZnS-Sm and

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On the Interaction of "Blue" and "Samarium" Centres in the ZnS-Cm(Cl) Phosphor

ZnS-Sm(Cl) respectively. In the absence of deep capture levels storing of a light sum in the ZnS-Sm(Cl) phosphor at low temperatures lowers the intensity of the blue emission below 195°K because of the de-exciting action of the exciting light of the 365 mμ mercury line. Acknowledgments are made to T.I. Voznesenskaya and L.A. Vinokurov for help in this work and to M.V. Fok for his advice. There are 4 figures, 2 tables and 3 Soviet references.

SUBMITTED: April 29, 1958

Card 3/3

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S/048/59/023/011/006/012
B019/B060

24.3500 (1035, 1138, 1160)

AUTHOR: Trapeznikova, Z. A.

2/

TITLE: On Luminescence Centers in Phosphors From Zinc Sulfide
Activated by Samarium ✓

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959,
Vol. 23, No. 11, pp. 1319-1325

TEXT: If rare-earth elements are used as activators in zinc sulfides, this phosphor exhibits a fluorescence line spectrum, which is characteristic of the rare-earth element ions. As the author showed in previous papers, the spectrum of these phosphors depends on the gas composition when sintering, on various additions (zinc oxides, halogens), and on the introduction of other activators (Cu). The ions of the activator and their close neighborhood are regarded to be the luminescence centers, and other luminescence centers must arise, if Cu-, O-, and Cl-ions are additionally added. The possibility of the formation of different luminescence centers is experimentally investigated here. The preparation of phosphor activated with samarium consisted first in purifying the zinc sulfide from oxygen-containing impurities, samarium was then added in the form of sulfide, and

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On Luminescence Centers in Phosphors From
Zinc Sulfide Activated by Samarium

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B019/B060

sintering took place at over $1,020^{\circ}\text{C}$. The phosphor $\text{ZnS} - \text{Sm}$ exhibits absorption lines in the range of $415 - 569 \text{ m}\mu$, which may be observed already at $5 \cdot 10^{-4} \text{ g-atom/MolZnS}$, whose intensity increases with rising concentration, without, however, any change in their position and relative intensity. The gas medium used for sintering has no influence on the spectrum. The luminescence brightness of the rare-earth elements is then investigated; the luminescence spectrum of samarium in zinc sulfide, which is subdivided into three line groups, is described, and the intensity ratio of these line groups to one another is dealt with. The temperature influence is investigated and luminescence spectra are examined during excitation by light. Finally, the following survey is given: 1) Samarium in zinc sulfide is apt to give rise simultaneously to two, possibly even more types of luminescence centers, which exhibit various probabilities as to the capture of electrons and holes. The amount of these centers depends on the samarium concentration and on the production conditions of the phosphor. 2) The quantitative ratio of two of these centers depends on the samarium concentration. These centers differ from the oscillation structure of the upper excited and the lower ground states. The existence of two excited electron levels is characteristic of these centers. 3) The brightness of luminescence of different centers and thus also the lumines-

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85772

On Luminescence Centers in Phosphors From
Zinc Sulfide Activated by Samarium

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B019/B060

cence spectrum depend on the conditions acting upon the kinetics of the processes, which are related to the transition of electrons and holes.

4) If fault spots in the lattice form to a larger amount, the luminescence spectrum of samarium with light excitation ($\lambda = 365 \text{ m}\mu$) is observed to broaden. The author thanks T. I. Voznesenskaya and R. M. Medvedeva for assistance given, and V. V. Antonov-Romanovskiy and M. V. Fok for valuable advice during the investigation and for discussion of the results. There are 6 figures, 2 tables, and 4 Soviet references.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR
(Institute of Physics imeni P. N. Lebedev of the Academy
of Sciences, USSR)

Card 3/3

TRAPEZNIKOVA, Z. A., FOK, M. V., ANTONOV-ROMANOVSKIY, V. V., DUBININ, V. G., PROKHOROV,
A. M.

"Detection of ionization of Eu^{++} in the phosphor SvS-Eu , Sm by the paramagnetic
resonance absorption method."

report submitted to The Electrochemical Society, 117th Meeting - Chicago, Ill.,
1-5 May 60, Symposium on Luminescence.

Physics Institute im. P. N. Lebedev, USSR Academy of Sciences.

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AUTHORS:

TITLE:

S/051/60/009/003/014/019/XX

E201/E191

Dubinin, V.G., and Trapeznikova, Z.A.

A Paramagnetic Electron Resonance Study of the
Activator-Valence Changes on Excitation of SrS:Eu:Sm
Phosphors

PERIODICAL: Optika i spektroskopiya, 1960, Vol 9, No 3, pp 360-364


TEXT: One of the unresolved problems in luminescence is the question of direct ionisation of activators during excitation of a phosphor, with subsequent de-ionization during natural or forced decay. To tackle this question it is necessary to know the valence state of an activator. Paramagnetic resonance absorption is a reliable method of obtaining the valence state. This method was used to study Eu^{2+} ions in SrS:Eu:Sm , $\text{SrS:Eu:Sm}(\text{SrCl}_2)$, and $\text{SrS:Eu:Sm}(\text{LiF})$ phosphors which were first completely de-excited and then illuminated with light in the absorption region of Eu^{2+} . The paramagnetic absorption lines of Eu^{2+} were reduced by 12-16% in intensity on excitation with light in the Eu^{2+} absorption region. Assuming that the reduction in paramagnetic resonance absorption is directly proportional to a fall in the number of Eu^{2+} ions, it

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04737

S/051/60/009/003/014/019/XX
E201/E191

A Paramagnetic Electron Resonance Study of the Activator-Valence
Changes on Excitation of SrS:Eu:Sm Phosphors

was concluded that the ionisation process $\text{Eu}^{2+} \rightarrow \text{Eu}^{3+}$ occurs
to the extent of 12-16%. This conclusion was confirmed by a fall
in the optical absorption coefficient (deduced from measurements
of the diffuse reflection coefficient) on excitation, which
indicated a decrease in the number of non-ionised activator centres.
A third proof of the $\text{Eu}^{2+} \rightarrow \text{Eu}^{3+}$ process in 12-16% of Eu^{2+} ions
came from measurement of the absolute number of quanta emitted by
the phosphors on illumination with infrared rays. 
There are 1 figure and 10 references: 6 Soviet and 4 English.

SUBMITTED: January 14, 1960

Card 2/2

83916

S/051/60/009/004/009/034
E201/E191

26.2264

AUTHORS:
TITLE:

Dubinin, V.G., and Trapeznikova, Z.A.
Use of Electron Paramagnetic Resonance in a Study of
SrS Phosphors Activated with Eu

PERIODICAL:

Optika i spektroskopiya, 1960, Vol 9, No 4, pp 472-477
Paramagnetic resonance makes it possible to determine
directly the light sum stored by a phosphor (Refs 1-3). The
value of the stored light sum was found from the change in
paramagnetic resonance absorption on excitation of SrS:Eu:Sm
phosphors. The energy given off as radiation was found from the
absolute number of quanta emitted when the phosphors were subjected
to infrared light; the quanta were measured with a photomultiplier
S-32 (FEU-32), calibrated in energy units. Comparison of the
stored and emitted light sums gave the proportion of the stored
energy lost by quenching processes occurring in the phosphor after
ionization of the activators. Some of the SrS:Eu:Sm phosphors were
prepared with a LiF flux, others without such a flux. The amounts
of the activators were kept the same in both groups of phosphors.
The change in paramagnetic absorption of Eu²⁺ on excitation showed
that this activator was ionized to the same extent (13-16%) in both

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APPROVED FOR RELEASE

S/051/60/009/004/009/034
E201/E191

Use of Electron Paramagnetic Resonance in a Study of SrS Phosphors
Activated with Eu

groups of phosphors. It was found that in the phosphors without the flux only about one half of the recombination acts produced radiation, while in the phosphors with the flux practically all recombinations were accompanied by emission of radiation (Table 1). It was suggested that the SrS:Eu:Sm phosphors contained centres of various types, some of which emitted light quanta on recombination and others transferred their recombination energy to the lattice in the form of heat. Introduction of the LiF flux altered the ratio of the numbers of these two types of centres, increasing the amount of centres emitting light quanta on recombination. It was also found that the phosphors without the flux lost their stored light sum more rapidly with time (a figure on p 476 shows this quite clearly). This indicates that in the phosphors without the flux more electrons were stored at shallow levels where their lifetimes were considerably shorter than in deep levels. Consequently the stored light sum decreased more rapidly with time in the phosphors without the flux. Acknowledgements are made to V.V. Antanov-Romanovskiy and M.V. Fok for their advice.

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E201/E191

Use of Electron Paramagnetic Resonance in a Study of SrS Phosphors
Activated with Eu

There are 1 figure, 3 tables and 5 references: 4 Soviet and
1 English.

SUBMITTED: February 11, 1960

Card 3/3




S/253/62/000/007/001/001
1056/1256

AUTHOR: Trapeznikovas, Vadimas

TITLE: Cybernetics and automation

PERIODICAL: Mokslas ir technika, no. 7, 1962, 3-6

TEXT: Automatic control, cybernetics and associated problems, and the field where the new discipline is applicable, e.g. in living organisms, human nervous system, various types of apparatus, economic systems. etc., are discussed. The basic theory is that control processes are divisible into 1) sensory measures, 2) control strategy decisions, and 3) effectuation of strategy decided on. Science is currently passing through a transition stage from the control of individual unitray aggregates to complex systems of analysis and control, particularly at remote distances, e. g. in cosmic navigation by the use of ingenious telemetric and telemechanic instrumentation. There are 2 figures.



Card 1/1

USSR/General Problems of Pathology - Pathophysiology of
Infectious Process.

U.

Abs Jour : Ref Zhur - Biol., No 19, 1958, 89525

Author : Trapezontseva, R.A.

Inst : Rostov Medical Institute.

Title : Materials of Study of Biochemical Shifts in Leprosy.
Some Problems of Bromium Metabolism.

Orig Pub : Sb. tr, Rostovsk. med. in-ta, 1957, 189-205.

Abstract : No abstract.

Card 1/1

TRAPEZONTSEVA, R.A., kand.med.nauk; VESELOVSKAYA, Kh.A.

Catalase content of the blood in leprosy. Sbor. nauch. rab. po lepr.
i derm. no.13:21-28 '59. (MIRA 14:6)
(CATALASE) (LEPROSY)

TRAPEZONTSEVA, R.A., kand.med.nauk; VESELOVSKAYA, Kh.A.

Bromine, potassium, and calcium metabolism in leprosy patients.
Sbor. nauch. rab. po lepr. i derm. no.13:29-42 '59. (MIRA 14:6)
(BROMIDES IN THE BODY) (CALCIUM IN THE BODY)
(POTASSIUM IN THE BODY) (LEPROSY)

TRAPEZONTSEVA, R. A., Cand Med Sci -- (diss) "Changes of
Bromine Content in the Blood of Patients with Leprosy."
Rostov-on-Don, 1957. 19 pp (Rostov-on-Don State Med Inst),
200 copies (KL, 50-57, 121)

- 43 -

TRAPEZONTSEVA, R.A.

Daily excretions of 17-hydroxycorticosteroids in cancer of the
stomach. Vop. med. khim. 9 no.6:592-596 N-D '63. (MIRA 17:10)

1. Biokhimicheskaya laboratoriya Nauchno-issledovatel'skogo
Instituta rentgenologii, radiologii i onkologii, Rostov-na-Donu.

FELIKAN, V.; TRAPI, S.

Amebiasis of the liver & its treatment. Cas. lek. cesk. 97 no.35:1099-1102 29 Aug 58.

1. Nemocnice Cs cerveneho krize v Condizinu.
(AMEBIASIS, HEPATIC, epidemiol.
in No. Korea (Cz))

Trapitsyn, N.F.

24(7)

PHASE I BOOK EXPLORATION

L'ouv. Universitet

Materialy I Vsesoyuznogo soveshchaniya po spektroskopii, 1956.
t. II: Atomya spektroskopii (Materials of the 10th All-Union
Conference on Spectroscopy, 1956. Vol. 2: Atomic Spectroscopy).
L'vov: Izd-vo L'vovskogo univ., 1958. 368 p. (L'vovskiy
Naukovedchy sbornik, vyp. 4(9)). 5,000 copies printed.

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po
spektroskopii.

Editorial Board: G.S. Landsberg, Academician, (Resp. Ed.);
B.S. Repent, Doctor of Physical and Mathematical Sciences;
I.L. Pabelinskiy, Doctor of Physical and Mathematical Sciences;
V.A. Fabrikant, Doctor of Physical and Mathematical Sciences;
V.G. Koritskiy, Candidate of Technical Sciences; S.M. Ryskiy,
Candidate of Physical and Mathematical Sciences; L.K. Klimovskiy,
Candidate of Physical and Mathematical Sciences; V.S. Mikhaychuk
(Deceased), Doctor of Physical and Mathematical Sciences; A.Ye.
Glauber, Doctor of Physical and Mathematical Sciences;
M.I. S.L. Gazer, Tech. Ed.; T.V. Saranyuk.

FUNCTION: This book is intended for scientists and researchers in
the field of spectroscopy, as well as for technical personnel
using spectrum analysis in various industries.

COVERAGE: This volume contains 177 scientific and technical studies
of atomic spectroscopy presented at the 10th All-Union Confer-
ence on Spectroscopy in 1956. The studies were carried out by
members of scientific and technical institutes and include
studies of biological and physical processes, studies of
electromagnetic radiation, physicochemical methods for controlling
elementary processes, studies of the technology of gas discharge,
optics and spectroscopy, abnormal dispersion in metal vapors,
spectroscopy and the combustion theory, spectrum analysis of ores
and minerals, photographic methods for quantitative spectrum
analysis of metals and alloys, spectral determination of the
hydrogen content of metals by means of isotopes, tables, and
atlases of spectral lines, spark spectrographic analysis,
statistical study of variation in the parameters of calibration
curves, determination of traces of metals, spectrum analysis in
metallurgy, thermochemistry in metallurgy, and principles and
practice of spectrochemical analysis.

Card 2/31

Materials of the 10th All-Union Conference (Cont.)

309/1100

Mikheyev, Ye.I., and V.K. Prokof'ev. Relative Oscillator
Energies for Certain Multiplets of Atoms and Ions

318

Bosikhin, V.S., and M.A. Mesterko. Luminous Intensity and
Ionization in a Plasma

320

Stolov, A.L., and K.M. Mochalov. Studying Elementary Processes
and Chemical Reactions in a Torch Discharge

323

Trapitsyn, N.F. Temperature Variations and Degree of
Ionization in Plasma of a High-Voltage A-C Arc

328

Kolesnikov, V.M., and V.V. Bordenova. Optical Study of a High-
Current Aluminum Arc in an Inert Gas Atmosphere

330

Semenova, O.P., and A.V. Dushina. Effect of Gas Composition
on the Thermal Excitation of Spectral Lines

334

Card 19/31

TRAPL, J.

On the problem of cutaneous melanoblastoma. Rozhl.chir.39 no.11:
762-765 N'60.

1. II. kozní klinika KU v Praze, přednosta prof. K.Hubschmann.
(MELANOMA)
(SKIN NEOPLASMS)

KALENSKY, J.; STAVA, Zd.; TRAPL, J.

Carcinoma teleangiectaticum. Case report. Sborn.lek.62 no.11:
321-323 N'60.

1. II. dermatologicka klinika fakulty vseobecneho lekarstvi
University Karlovy v Praze, prednosta prof.dr. K.Hubschmann.
(CARCINOMA case reports)
(BREAST NEOPLASMS case reports)

LIBANSKY, J.; TRAPL, J.

Treatment of erythroderma with leukeran. Cas.lek.cesk. 99 no.46:
1447-1450 11 N '60.

1. Ustav hematologie a krevni transfuze, prednosta prof. MUDr.
J.Horejsi. II. kozni klinika, prednosta prof. MUDr. K.Hubschmann,
Praha.

(ERYTHRODERMA ther)

(NITROGEN MUSTARDS ther)

5(4)

AUTHORS:

Breusov, O. N., Trapp, G.,
Novoselova, A. V., Simanov, Yu. P.

SOV/78-4-3-27/34

TITLE:

Thermal and X-ray Phase Analysis of the System SrF_2 - BeF_2
(Termicheskiy i rentgenofazovyy analiz sistemy SrF_2 - BeF_2)

PERIODICAL:

Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 3,
pp 671-677 (USSR)

ABSTRACT:

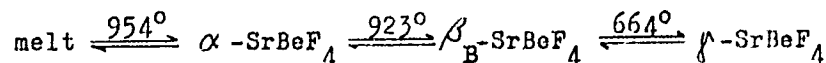
The system SrF_2 - BeF_2 was investigated by the method of differential-thermal and X-ray phase analysis. Beryllium fluoride was produced by thermal decomposition of ammonium beryllium fluoride and strontium fluoride from strontium carbonate and hydrofluoric acid. For the production of melts with a content of 0-50 mole % BeF_2 SrF_2 and strontium beryllium fluoride were used. For alloys with 50-97 mole % BeF_2 melts from strontium chloride and ammonium beryllium fluoride were used. Melts with more than 50 mole % BeF_2 are hygroscopic. The phase diagram of the system SrF_2 - BeF_2 was

Card 1/3

Thermal and X-ray Phase Analysis of the
System SrF_2 - BeF_2

SOV/78-4-3-27/34

plotted. At $883 \pm 18^\circ$ beryllium strontium fluoride forms a eutectic with strontium fluoride. Strontium beryllium fluoride melts congruently at $954 \pm 10^\circ$, and at $923 \pm 3^\circ$ a polymorphic transformation occurs. SrBeF_4 forms with beryllium fluoride a eutectic at $582 \pm 27^\circ$. On the thermogram of the melt with 65 % BeF_2 effects occur at $384 \pm 13^\circ$ and $334 \pm 5^\circ$, the nature of which could not be found by X-ray analyses. The compound SrBeF_4 was determined by X-ray analysis. This compound occurs in three modifications: α , β , and γ . From an aqueous solution the β form of SrBeF_4 precipitates with impurities of the γ form. Thermal and X-ray investigations of strontium beryllium fluoride were carried out and two schemes were given for the formation of the modification;

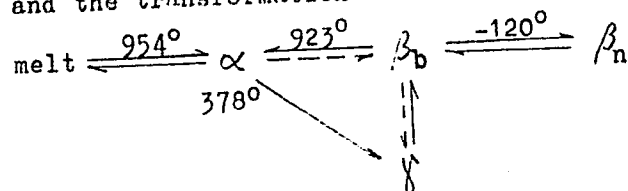


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Thermal and X-ray Phase Analysis of the
System SrF_2 - BeF_2

SOV/78-4-3-27/34

and the transformation:



There are 1 figure, 3 tables, and 10 references, 5 of which
are Soviet.

SUBMITTED: March 1, 1958

Card 3/3

TRAPUYLA, I.P., inzh.-mekhanik (g. Kaunas)

Kaunas efficiency promoters. Put' i put.khoz. no.10:37 0 '58.
(MIRA 11:12)

(Kaunas--Railroads--Tools and implements)

TRAPUYLA, I.P., inzh.-mekh. (Kaunas).

~~Train used for hauling slag. Put' 1 put. khoz. no.2:35 F '58.~~
(Kaunas--Railroads--Freight) (MIRA 11:3)

TRASHCHILOV, P. F.

6-12-3/14

AUTHOR: Trashchilov, P. F.

TITLE: Requirements for a Synchronous Work of the Aerophotographic and Photorecording Apparatus (Trebovaniya k sinkhronnosti raboty aerofotos'yemchnoy i fotoregistriruyushchey apparatury).

PERIODICAL: Geodeziya i Kartografiya, 1957, Nr 12, pp. 23 - 27 (USSR).

ABSTRACT: Formulae are given here for calculating the quantities of a non-synchronized work of the photorecording cameras of the radio-altimeter, the statoscope and the radio-bearing stations. The values for the permissible accidental oscillations of the non-synchronism are given, in dependence of the demands made on the accuracy of the termination of elements of outer orientation. On the basis of the statements made the following may be said. 1) In aerial photographs for cartographic purposes the work of the photorecording cameras of the radio-altimeter, of the statoscopes and of the radio-bearing stations must be synchronized with the work of the shutter of the main aerial camera. The oscillations of the non-synchronism of the work of cameras in dependence on the concrete technical requirements may not exceed + 0,01 sec. to 1,00 sec. - 2) The three formulae given here make it possible to determine the permissible values of non-synchronism of the work of the photorecording cameras of the

Card 1/2

Requirements for a Synchronous Work of the Aerophotographic and Photorecording Apparatus. 6-12-3/14

radio-altimeter, the statoscope and the radio-bearing station of the airplane with regard to the moment where the shutter of the aerial camera opens. The three formulae are:

$$\tau_1 = \frac{2 \delta H}{W \sin 2 \varphi}, \tau_2 = \frac{\delta \Delta H}{V_b \sqrt{1}} = \frac{1,06 \text{ m}}{V_b}, \tau_3 = \frac{\delta l}{W}$$

τ_1 - time, τ_2 - is the quantity of the non-synchronism of the work of the photocamera of the statoscope and of the shutter of the aerial camera. τ_3 - the quantity of the non-synchronism of the work of the shutter of the aerial camera and of the photorecording camera. H - is the altitude during photographing. W - the speed of the airplane. δH - is the error in the determination of the altitude during photographing. V_b - vertical speed of the airplane at which the photograph was taken. 1,06 m - meters. There are 3 figures, 2 tables, and 1 Slavic reference.

AVAILABLE. Library of Congress.

Card 2/2

TRATSEVITSKAYA, B. Ya.

TRATSEVITSKAYA, B.Ya.; TRUSOVA, V.G.; CHIZHIKOV, D.A.; KORSUNSKAYA, V.N.

Separation of niobium and titanium in chloride complexes. Trudy Inst.
met. no.2:87-91 '57. (MIRA 10:11)

(Chlorides) (Niobium) (Titanium)

2696 SPECIFIC HEAT OF ANHYDROUS MgCl_2 Q. Trupachnikova and G. Miljutin.
 Phus. Zaits. d. Sovjetunion, 11. 1. pp. 55059, 1937. In German.
 Measurements of C_p were made over a temperature range from 12° to 130° F, but no anomaly as to a Curie point was found in this region.
 LSC

1st and 2nd CROSS INDEX

3rd and 4th CROSS INDEX

PROCESS AND PROPERTIES INDEX

2778. Anomalies in the Specific Heats of Anhydrous CrCl_3 , CoCl_2 , NiCl_2 . O. Trappenberg, L. Schubnikow and G. Miljutin. *Phys. Zells. d. Sowjetunion*, 9, 3-3, pp. 237-263, 1936. In German.— The authors have measured the specific heats of anhydrous CrCl_3 , CoCl_2 and NiCl_2 within the temperature range of 14° to 130° K. CrCl_3 exhibits anomaly at 16.8° K, and CoCl_2 at 24.8° K, while NiCl_2 has two anomalies at 40.6° and 57.0° K. The position of the second maximum is not constant and depends on the cooling temperature to which the salt has been cooled. Thermal hysteresis has been observed between 56° K and 63° K, but only for NiCl_2 . The paper is replete with experimental details and data. H. H. Ho.

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A 53 J

ASB-51A METALLURGICAL LITERATURE CLASSIFICATION

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SA

2163. Anomaly in the Specific Heat of Anhydrous Ferrous Chloride. O. N. Trapeznikova and L. W. Schubalkow. *Phys. Zeits. d. Sowjetunion*, 7, 1, pp. 66-81, 1935. In German.—A description is given of a calorimeter suitable for the measurement of specific heats of powdered substances at low temperatures. The specific heat of anhydrous FeCl_2 is measured in the temperature range from 16 to 120° Abs. and a discontinuity is found at 23-50° Abs. L. A. W.

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1ST AND 2ND ORDERS

PROCESS AND PROPERTIES INDEX

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FARYNSKIY, R., inzh. (Novosibirsk); TRAKHTENBERG, A., inzh. (Novosibirsk)

Variable resistors. Radio no.2:52-53 F '64.

(MIRA 17:3)

TRAPIEZNIKOWA, Z. A.

POLAND / Physical Chemistry. Crystals.

B-5

Abs Jour: Ref Zhur-Khimiya, No 8, 1959, 26275.

Author : Trapiezniakowa, Z. A.

Inst : Not given.

Title : Some Optical Properties of New Phosphors Activated
by Rare Earth Elements.

Orig Pub: Postepy Fiz, 9, No 2, 211-222 (1958) (in Polish).

Abstract: The results from an investigation of ZnS phosphors
are presented. See RZhKhim, 1956, 49956. -- Ya.
Satunovskiy.

Card 1/1

TRAPITSYN, G.Ya.

Soviet Transcarpathia: a new region for the development of a
major canning industry. Kons.i ov.prom. 15 no.2:35-37
F '60. (MIRA 13:5)

1. TSentral'nyy nauchno-issledovatel'skiy institut konservnoy
i ovoshchesushil'noy promyshlennosti.
(Transcarpathia--Canning industry)

BOGDANOV, N.; TRAPITSYN, N.

Supply-bases for building-trade schools. Sel'.stoi. 14 no.10:
23 0 '59. (MIRA 13:2)

1. Direktor Krasnodarskoy shkoly stroitel'nykh masterov
(desyatnikov) (for Bogdanov). 2. Zaveduyushchiy uchebnoy
chast'yu Krasnodarskoy shkoly stroitel'nykh masterov (for
Trapitsyn).
(Krasnodar--Building trades--Study and teaching)

TRAPITSYN, N.F.; VEPRIK, A.V.; KALIKOV, N.A.

Independence of the temperature of an a.c. high-voltage
arc from the composition of the specimen. Izv. vys. ucheb.
zav.; fiz. no.5:26-28 '62. (MIRA 15:12)

1. Kirgizskiy gosudarstvennyy universitet.
(Electric arc)